Effect of Finite Larmor Radius on the Rayleigh-Taylor Instability of Two Component Magnetized Rotating Plasma

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The Rayleigh-Taylor (R-T) instability of two superposed plasmas, consisting of interacting ions and neutrals, in a horizontal magnetic field is investigated. The usual magnetohydrodynamic equations, including the permeability of the medium, are modified for finite Larmor radius (FLR) corrections. From the relevant linearized perturbation equations, using normal mode analysis, the dispersion relation for the two superposed fluids of different densities is derived. This relation shows that the growth rate unstability is reduced due to FLR corrections, rotation and the presence of neutrals. The horizontal magnetic field plays no role in the R-T instability. The R-T instability is discussed for various simplified configurations. It remains unaffected by the permeability of the porous medium, presence of neutral particles and rotation. The effect of different factors on the growth rate of R-T instability is investigated using numerical analysis. Corresponding graphs are plotted for showing the effect of these factors on the growth of the R-T instability.

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